

Castlemaine Naturalist

July 2011

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**Monthly newsletter of the
Castlemaine Field Naturalists Club Inc.**



Yellow Robin

Photo - Noel Young

Small Bushland Reserves survey

At the last meeting Chris Morris presented a plan for a club project to conduct preliminary surveys of a number of small bush blocks of Crown Land status occurring within the Shire of Mt Alexander. A list of these was compiled and summarised some years ago as part of the LCC / ECC evaluations in the area. Because of their small size (most are less than 20 Ha) little or no work has been done on them by DSE or Parks Victoria who do not have the resources to commit beyond the large reserves.

Chris has drawn up a spreadsheet for selected criteria against 17 reserves as a preliminary suggestion and invites feedback on its appropriateness. His approach is to keep it simple enough so that all club members can participate, either as individuals or a group, in doing some basic evaluation of these sites so that their significance can be assessed and permanently recorded. He has also contacted Parks representatives and found that they are keen to assist us in this worthwhile project by identifying and locating the listed reserves on a plan, and have also offered to supply materials such as aerial photographs covering the individual blocks.

The first problem is to accurately locate all the reserves, and define their boundaries. As a result of a recent meeting with a Parks representative, Chris's spreadsheet is under revision, both to add some blocks and delete larger area reserves from our list. In general it was decided that we would tackle only reserves less than 20 Hectares. Parks are drawing up a new location map with local names against the ECC reference code where possible.

The spreadsheet criteria include the following -

- Size (Ha);
- Tree density (sparse or dense)
- Tree age (majority young or old)
- Native vegetation (majority)
- Weed threat (not evident, minor, severe)
- Firewood removal (not evident, minor, severe)
- Gully erosion? (not evident, minor, severe)
- Fence condition (bad or good)
- Stock grazing (not evident, minor, severe)
- Bird numbers (few or many)
- Native wildlife signs eg scat (yes or no and include type)
- Comments

One of the better known blocks is the South Walmer Reserve on Walmer Road, so as an experiment we have decided to make our next club excursion to this location to see what we can find out in an afternoon.

Researching the Barking Owl

Noel Young

At the June meeting, Natasha Schedvin recounted her Ph D research on the distribution and behaviour of Barking Owls in Victoria, which was mostly carried out in what is considered to be the stronghold of this species in the State – the Beechworth – Chiltern Forest.

She succeeded in applying small transmitters to the backs of 13 individual birds, and tracked them at night over several seasons. She found that the owls are highly territorial, and that their home range can be quite large – covering on average 1400 Ha., though varying considerably for different birds. The territories have very little overlap, and are essentially held for the life of the pair, which can be some 30 years.

Unless of course, some unforeseen event dictates otherwise. At one time she recalls finding a pair of Powerful Owls had forcibly evicted a regular pair of Barking Owls, taking over their nest tree and range. And in 2003 in the middle of her project, the Eldorado bushfire tore through the Chiltern Park destroying about 50% of the study area. Unable to enter the area for about two weeks, she then came across one of the study owls on the ground, having apparently died of smoke or asphyxiation, as it was not burnt. Other owls survived, and did not (could not) move from their territories. After an initial small bonanza of prey surviving the fire but having no cover, some owls then starved rather than move away. Eventually only 10 pairs survived the fire.

Natasha returned in 2007 to find that the population had dropped again, but last year it had stabilised.

As with other owls, these birds depend on hollows for breeding sites. While fire helps to create tree hollows, hot fires also destroy the old trees. We saw before-and-after photos of a magnificent old yellow Box over 1m diameter, and the home to several birds and animals. Having fallen over in the bushfire it was completely consumed to a pile of ash. Another Red Box was photographed burning inside the trunk having ignited some three months after the fire went through.

Natasha has since extended her search for the 'Barkers' through the northern CMA and has found only 11 pairs other than the 9 pairs remaining in the Beechworth – Chiltern NP. It appears that the long drought could have had a detrimental effect on their population.

Weeding the Gardens

Denis Hurley

A Broom pull at the north end of the Botanical Gardens was conducted in lieu of the usual Saturday afternoon field trip on June 11th.

Eight members attended on a sunny but cool afternoon at the "island", a section bounded by a loop of walking paths and the area worked on since 1994. Part of this area is also known for the Eltham Copper Butterfly (*Paralucia pyrodiscus lucida*). Regular work to remove introduced weed species carefully so as not to disturb native grasses and other understory plants has been essential.

'Broom pull' is somewhat of a generalisation as the area is sadly encroached each season by the following; Belladonna Lily (*Amaryllis belladonna*), Cootamundra wattle (*Acacia baileyana*), Cotoneaster (*Cotoneaster* sp.), Hawthorn (*Crataegus monogyna*), Blackberry (*Rubus fruticosus* sp agg.) to name just a few.

Not to mention the old 20+ m. tall Radiata pines (*Pinus radiata*), although towards the end of our shift we did see 30 or 40 small birds, possibly Pardalotes, working the crowns of the trees.

But all is not lost, one only has to look at the weed infestation on the lower side of the paths to see that the constant work has paid off, and the 'island' plants have had a much better chance to grow and re-seed. Perhaps we may be able to convince the Council to assist in weed control outside this area in the future.

Many thanks to those nimble fingers and stiffened backs for the effort put in.

Bird Navigation depends on Quantum Mechanics

Noel Young

Scientific discoveries continue at a steady, some would say a cracking pace, despite adversity from many quarters since the days of Galileo. So I often peruse the popular science news magazines in a vain attempt to keep up, and every so often turn up a gem.

Like, where are we with figuring out the “super-senses” of the creatures we share the planet with? Super-sense is a term we use for an advanced ability that we humans don’t possess, like the unerring sense of direction exhibited by many such creatures. (How dare they – our egocentric superiority has been one of the grounds for canning science, and still is by some. However, I shall assume that all who read this are fellow students of nature, and we are no longer surprised at the amazing things we observe.)

Several decades ago it was shown that European Robins kept in a room with no outside light, would always head in the right direction when released at their migration time, and by using powerful magnets they could be disorientated, so it was clear that they detect the earth's magnetic field, although it was not known how until some time later.

In 1975, benthonic marine bacteria were found to contain chains of crystalline iron compounds which turned each bacteria into a tiny compass, and this led to the search for similar compounds in other animals. In birds, magnetic crystals were first found in homing pigeons and bobolinks; nerve endings in the skin inside the upper beak contain bullet shaped structures rich in iron. As similar structures have recently been found in birds with diverse lineages, it is now assumed that iron based magnetoreception is common to most if not all birds.

Meanwhile, researchers in the field of biophysics were studying unusual chemical reactions that can be affected by magnetism. To quote the article from which I am drawing -

“Electrons normally dance round a molecule in pairs, but light can break this happy tango by shunting an electron from one molecule to another. The result is a pair of radicals – molecules with a solo electron. Electrons have a quantum property called spin, and in a radical pair the spins of the two unpaired electrons are linked; they either spin together or in opposite directions. The angle of a magnetic field can affect the flipping of the electrons from one of these spin states to the other, and in doing so it can affect the outcome or the speed of chemical reactions involving the radical pair.”

If such a mechanism depends on light, it was logical to look for these molecules in the eye. A number of them aligned in an array across the retina could generate a pattern that could be sensed as the direction of the earth's magnetic field. All this was theoretical until in 1998 a biophysicist realised there was a potential candidate called cryptochrome, a light sensitive protein in plants, and he predicted that if these existed in birds eyes, their spin state reactions could be disrupted by high frequency magnetic fields. By 2004, other researchers had shown this to be true for robins and other birds.

Genetic research has since shown the same mechanism to exist in fruit flies and other insects including butterflies. The implication is well supported though no-one has yet worked out the structure of cryptochrome.

"One thing that is certain is that the compass of birds is located in their eyes. In fact, the tight connection between vision and magnetoreception suggests that birds can literally see magnetic fields."

It is probable that birds can see the magnetic field as a directional shading, perhaps something like the effect of polarised light seen through a filter.

So what of the magnetic beak receptors? Why would birds have two magnetic senses? Well, research indicates that the beak receptors react to changes in *intensity* rather than direction of the field. Broadly, earth's magnetic intensity increases toward the poles, but as magnetometer surveys attest, it varies locally with the geology, and provides a topography that birds could commit to memory as with visual landmarks. Indeed, it would be a much more reliable topography than the visible, which can be obscured by weather and poor light.

More recent research seems to confirm that birds use a mental map based on experience, by contrasting the behaviour of juvenile birds attempting to navigate by their eye compass against experienced adults which were navigating based on a mental map using their beak receptors. It has also been shown that at least some birds are capable of correcting wrong magnetic information by calibrating against the sun each day. Perhaps they instinctively know that at historical intervals the earth tries to trick them by reversing its polarity!

If you would like to read much more detail about this, including who discovered what and when, I recommend tracking down the original article - "Masters of magnetism" by Ed Yong in New Scientist, 27 November 2010.

Notice from the Secretary

Every month the Club receives appeals from various organisations requesting donations to assist with environmental causes. In the past we have sometimes responded to such appeals. However our Club subscriptions barely cover our printing and mailing costs and other administrative matters, so leaving nothing in kitty to assist these appeals.

Instead we will mention these appeals in our Newsletter so members who feel so inclined can make their own response.

This month we have :-

1. Birds Australia

2011 International Year of Forests. An appeal to save forests. Nearly 1/2 of Australian birds rely on forests to survive. Donations sought at www.birdsaustralia.com.au or 1300 730 075

2 Vic National Parks

An appeal for funds to fight the reintroduction of cattle into the Alpine Nat Park.

The brochure lists damage caused by cattle as determined by the Government Dept, DSE, in 2005.

Rather Political, the committee did not feel it should commit members funds to what may be a divisive matter.

www.vnpa.org.au

South East Australian Naturalists Association Inc

Spring camp 2011

will be held at PHILLIP ISLAND

Saturday 29th October to Tuesday 1st November
(Melbourne cup weekend)

Hosted by FNCV

Activities may include mammal trapping, bat trapping, bird watching, rock pool rambles, beach walks, geology, microscopy, day trip to French Island, junior activities, and much more.

enquiries to seanacamp@fncv.org.au

Bird count update

Chris Morris passed on the notice of results from BOCA for the **December 2010** bird count. Here is a summary of the numbers of the list totalled from individual districts:

	Total species	Total individuals
Melbourne	199	63,639
Victorian country	282	54,252
Queensland	274	47,186
New South Wales	252	16,056
Total Count	398	181,133
Castlemaine	88	1,620

Observations

- ◆ At the June meeting -
- ◆ Denis Hurley noted that *Pterostylis striata* is flowering early in a patch, but there is no sign of the large patch identified by Ern Perkins last year. Eastern Spinebills are about, Red browed Finches up to 15 or so, the resident Golden Orb Weaver has a leg missing (if attacked they can drop a leg or several); and he managed to photograph the bat mentioned last month, inside his woodshed, and it looks like an Inland Broad-nosed Bat
- ◆ Jan Hall noted Golden Wattles starting to come out – and that Francis Cincotta had remarked to her that she has never seen them flower this early
- ◆ Geraldine reported that the Red browed Finches around their place have increased their numbers to 30 or more
- ◆ Neville Cooper reported that Beth, on an early morning walk in Elphinstone, saw a Phascogale run across the path
- ◆ Late reports -
- ◆ Linda Constable, a resident of Nth Harcourt reported sighting a flock of 9 Gang-gangs feeding on Hawthorn berries in Happy Valley road last Monday, June 20. I wonder whether anyone else has seen any in this district. Linda asked whether they are common in this district. I had to say that as far as I could tell, they had not been previously reported - George Broadway

Disclaimer: The opinions expressed in this newsletter are those of the contributors and not necessarily those of the club

Castlemaine Field Naturalists Programme

July 2011

Fri July 8 meeting: speaker EUAN MOORE Birding in Sri Lanka

Sat July 9 field trip: South Walmer bush reserve

Fri August 12 meeting: speaker CRAIG GRABHAM on bats

Sat August 13 field trip: to be announced

VISITORS ARE WELCOME AT CLUB ACTIVITIES

General meetings - (second Friday of each month, except January) are held in the Uniting Church (UCA) Hall (enter from Lyttleton St.) at 7.30 pm.

Field Trips - (Saturday following the general meeting) leave from the car park opposite Castle Motel, Duke Street at 1.30pm sharp unless stated otherwise. BYO morning and/or afternoon tea. Outdoor excursions are likely to be cancelled in extreme weather conditions. There are NO excursions on total fire ban days.

Business meetings - fourth Thursday of each month, except December, at Denis Hurley's; 20 Merrifield St., at 7.30 pm. All members are invited to attend.

Subscriptions for 2011

Ordinary membership: Single \$27, Family \$35

Pensioner or student: Single \$24, Family \$29

Subscription includes postage of the monthly newsletter, Castlemaine Naturalist

2011 Committee

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